

Amusement park rides, answers from CPSC

September 15, 1999

The Honorable Edward J. Markey
U.S. House of Representatives
2108 Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Markey:

Thank you for your letter of September 2, 1999, concerning amusement rides. I share your concern about the safety of fixed-site amusement park rides and the six deaths that have occurred on those rides this year. Regrettably, the U.S. Consumer Product Safety Commission (CPSC) does not have the general statutory authority to investigate these deaths or the injuries associated with fixed-site rides. Thus, we have not determined if any of the rides are defective and are unable to obtain corrective action to address any defects. This is in stark contrast to our authority over mobile rides.

I have asked the Commission's technical staff to assist me in answering many of your questions. The questions and answers are as follows:

Question 1. To what extent does the CPSC have jurisdiction over the safety regulation of amusement park rides? Please provide citations and relevant statutory and report language.

Section 3(a)(1) of the Consumer Product Safety Act ("CPSA") defines "consumer product" as including

any mechanical device which carries or conveys passengers along, around, or over a fixed or restricted route or course or within a defined area for the purpose of giving its passengers amusement, which is customarily controlled or directed by an individual who is employed for that purpose and who is not a consumer with respect to such device, and which is not permanently fixed to a site. Such term does not include such a device which is permanently fixed to a site.

15 U.S.C. § 2052(a)(1)(emphasis added). The pertinent House Report stated, "The Committee intends to clarify that the agency does not have jurisdiction over amusement park rides such as those found in 'theme parks,' but it does have jurisdiction over amusement park rides such as those found in traveling carnivals." H.R. Rep. No. 97-158 (June 19, 1981). The House Conference Report stated, "The Conferees recognize that an amusement park may alter the location of an amusement ride that it operates to improve the operation of the ride, to carry out the major maintenance on the ride or to dispose of the ride. Infrequent alteration of the ride for such purposes does not give the agency jurisdiction over the ride." H.R. Conf. Rep. No. 97-208, at 888-89 (1981), reprinted in 1981 U.S.C.C.A.N. 1010, 1250.

Question 2. Was CPSC jurisdiction curtailed in 1981 barring the agency from regulating fixed-location amusement park rides such as roller coasters? Please

provide citations and relevant statutory and report language.

Prior to this 1981 legislation, courts were divided on whether CPSC had jurisdiction over amusement park rides. E.g., compare State Fair of Texas v. United States Consumer Product Safety Commission, 650 F.2d 1324 (5th Cir. 1981)(jurisdiction), judgment vacated as moot, 450 U.S. 1026 (1981), with Robert K. Bell Enterprises, Inc. v. Consumer Product Safety Commission, 645 F.2d 26 (10th Cir. 1981)(no jurisdiction). In 1981, Title XII of the Omnibus Budget Reconciliation Act, Pub. L. 97-35, added the language described in the answer to Question 1 concerning amusement rides to the CPSCA.

Question 3. Are there any states which do not regulate amusement park rides at the state level? Does this mean that in some states there is no safety inspection of fixed location rides at all? Please provide if possible, a state-by-state summary of safety regulatory authority of amusement park rides.

According to the best information available to us, there are 14 states, and the District of Columbia, that do not have a program in which state officials inspect fixed-site amusement park rides.

With respect to mobile amusement rides, according to the best information available to us, there are 10 states that do not have a program in which state officials inspect mobile rides.

Enclosed are two charts identifying state regulatory authority, one for fixed-site rides and one for mobile rides. We are updating this information.

Question 4. Who is responsible for judging the health effects of proposed design features?

Regulation of fixed-site amusement rides, if regulated at all, is currently only at the state and local level. The responsibility for ride safety rests with the manufacturers in terms of the design, and with the amusement ride facility for maintenance and safe operation. There is no national regulatory body that has the responsibility for reviewing proposed design features to assure that they do not pose a risk or health hazard. Some industry associations try to encourage safety measures. The American Society for Testing and Materials (ASTM) has coordinated the development of voluntary standards for amusement ride manufacturers and owners. These standards, however, are general and are limited to what should be included in the maintenance instructions, which are provided to owners of the ride.

Question 5. Are there G-force limits imposed on the design of amusement park rides? At what thresholds do these G-forces begin to trigger adverse health effects, such as death or of serious injuries, strokes, neurological damage, or other serious adverse health impacts, either within the context of amusement park rides, or in other relevant contexts?

Staff is not aware of state regulations or existing standards that control the range of G-forces (the pull on the body exerted by gravity or multiples of gravity) to which a ride may subject riders. Although tolerance levels to multiples of normal gravity (G) have not been defined for children, data do exist for adults exposed to gravitational loads in excess of 1-G. Among the physiological effects experienced at these levels are vestibular disturbances (loss of balance and dizziness), blurred vision (due to pooling of blood in the brain and

eyes) as well as temporary blindness and loss of peripheral vision/consciousness (due to pooling of blood in the legs). These effects are dependent on the direction of the acceleration relative to the body as well as the duration of the exposure (i.e., longer exposures increasing the likelihood of their occurring).

Studies performed by aeromedical researchers over a number of years, using servicemen and normal volunteers, indicate that loss of consciousness is typically experienced in response to sustained exposures in excess of 3-5 G's. It is worth noting that these studies were performed on healthy individuals. The effects on the aged, ill, or otherwise compromised individuals, could be dramatically different. Loss of consciousness as a result of redistribution of blood volumes could render the individual more vulnerable to other injuries, which a conscious individual might be able to avoid. Abrupt onset of accelerations or decelerations could result in numerous injuries to bone or soft tissue. Of particular concern would be whiplash-type injuries, cervical fractures or dislocations, as well as concussions, all of which would be more prominent in those cases where the body is in some manner restrained, but the head is free to pivot. Furthermore, rotational acceleration of the head, which could occur if the head was turned perpendicular to the direction of the acceleration/deceleration at the onset of the force, could cause significant closed-head injuries, including diffuse axonal injury (injury to cells of the brain), or subdural hematomas (collection of blood between the protective layers that cover the brain), either of which could result in concussion or coma. Additional injuries/effects that may be experienced on rides with excessive G-exposures would include rupture of blood vessels due to congestion of blood, torn or detached retinas, lower back injuries, and death in those cases where a rider is projected from the ride.

Aberrant operation of these rides or improper behavior on the part of the consumer may serve to amplify the risks associated with amusement rides. Similarly, riders with medical conditions such as high blood pressure, heart ailments, back or neck problems, and pregnancy would also assume a greater risk of injury.

Question 6. Please provide by year and ride category statistics for serious injuries or deaths occurring on amusement park rides over the last 5 years. If possible, separate out the statistics on old rides from the statistics on new rides. In your judgment, do these statistics indicate any increase in the frequency or severity of amusement ride injuries over time? Please explain.

Enclosed is a July 1999 report which provides injury data for 1994 through 1998 (Table 1) and fatality data for 1987 to June 30, 1999 (Tables 2-4, and Appendix A). No information is available to distinguish between old versus new rides.

The report indicates that the number of emergency room-treated amusement ride-related injuries known to have occurred in fixed-site amusement parks has increased from an estimated total of 2,400 in 1994 to 4,500 in 1998. In addition, some amusement ride-related injuries are reported each year where it is unknown whether they are related to either a fixed site or a mobile ride; some of these ambiguous cases probably involved fixed site amusement rides.

Across all sites (fixed, mobile, unknown), the total estimated number of amusement ride-related injuries increased from 7,400 in 1994 to 9,200 in 1998, a statistically significant upward trend. Injuries known to be related to mobile rides increased only slightly, from 2,000 in 1994 to 2,100 in 1998, while injuries related to rides of unknown fixed/mobile

status decreased from 3,000 in 1994 to 2,600 in 1998. Thus, the upward trend in total injuries is based on an increase in fixed-site ride injuries.

Question 7. What percentage of these serious injuries or deaths are deemed to be the result of "patron error"?

No information is available to derive the percentage of incidents involving specific causal factors, but CPSC investigations have revealed that relevant factors include consumer behavior, operator behavior, mechanical failure, and design limitation (see page 9 and Appendix B of the July 1999 report).

Question 8. How reliable is the statistical information currently available on this subject? Is any segment of the industry required to report injuries or deaths to any regulatory or public health official? Is this reported by company, or by individual park, or by individual ride? Is the industry required to keep logs regarding mishaps by park or by individual ride? Is the industry currently required to comply with any standard health or accident reporting regime? How could this be improved?

Manufacturers, distributors, and retailers of mobile amusement rides are required to report to CPSC if they obtain information about their ride that reasonably supports the conclusion that the ride has a defect that could create a substantial product hazard or presents an unreasonable risk of serious injury or death. 15 U.S.C. § 2064(b). There is no reporting requirement for fixed site rides. If the CPSC finds that a mobile ride has a defect it can seek corrective action. There is no such authority for fixed site rides.

CPSC monitors amusement ride-related injuries through the National Electronic Injury Surveillance System, a nationally representative stratified sample of hospital emergency rooms in the U.S. These estimates are very reliable. Fatality data are obtained through incident reports, newspaper clippings, and death certificates under pertinent external-cause-of-death-codes (E-codes) purchased from the states. Although CPSC obtains information about most amusement ride-related fatalities through these sources, some fatalities may not be identified. Therefore, unlike for injuries, our data on fatalities provide a report of known deaths, not a national estimate.

Individual states may require reports of injuries or deaths on rides operating in their state. For example, our information indicates that the States of Massachusetts, Kentucky, Illinois, Florida and Maryland require the reporting of any injury or death from a ride so they can make an independent evaluation of the ride.

CPSC has no record keeping requirements for amusement rides. Individual states may require firms to maintain records, and insurance companies may require maintenance of records as part of a firm's insurance requirements.

We are not aware of any standard health or incident reporting form although the Council for Amusement & Recreational Equipment Safety (CARES), an association of state amusement ride officials, has proposed and is developing such a form. Individual states, insurance companies or various ride trade associations may have requirements or recommendations.